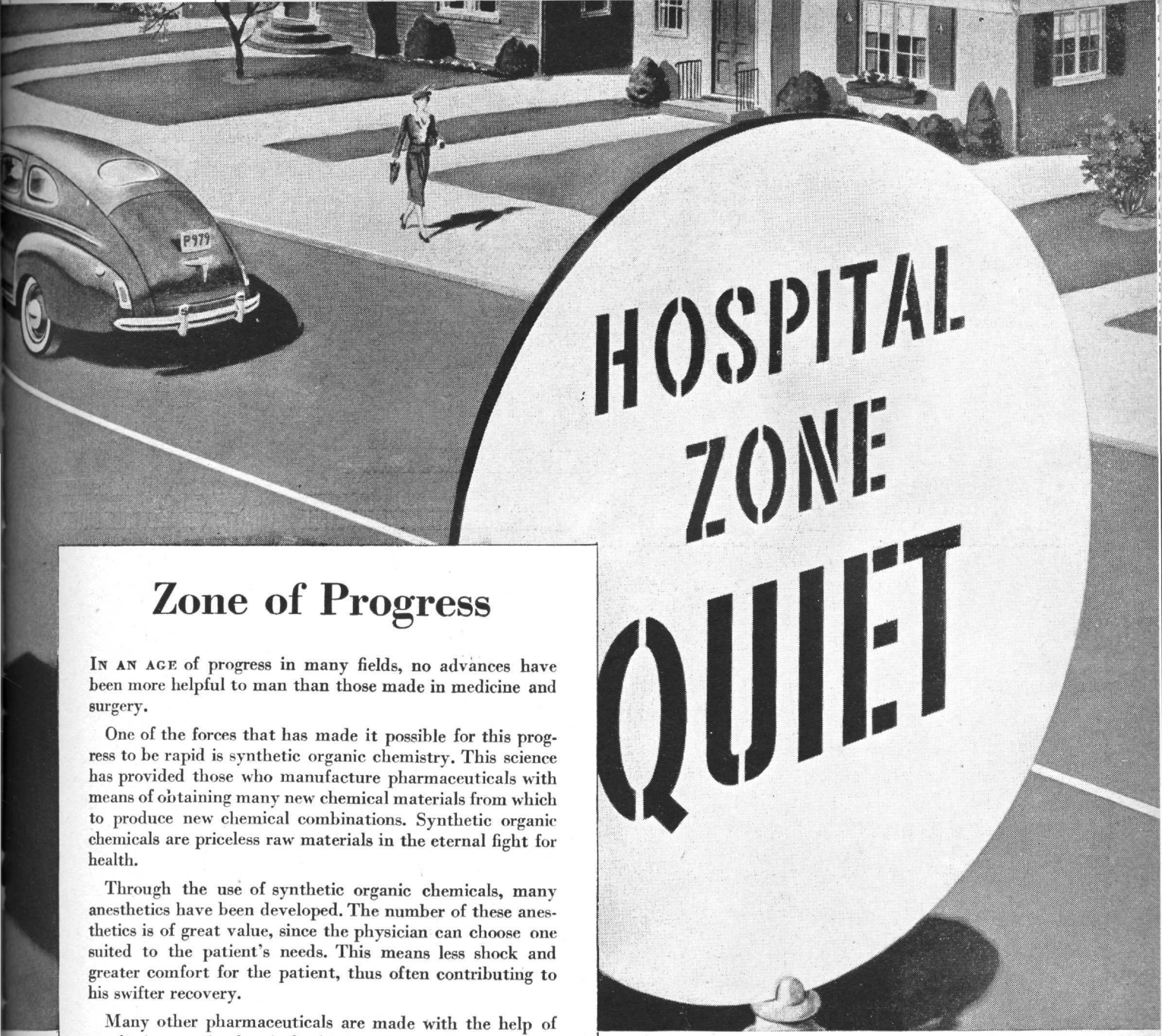


Zone of Progress

IN AN AGE of progress in many fields, no advances have been more helpful to man than those made in medicine and surgery.

One of the forces that has made it possible for this progress to be rapid is synthetic organic chemistry. This science has provided those who manufacture pharmaceuticals with means of obtaining many new chemical materials from which to produce new chemical combinations. Synthetic organic chemicals are priceless raw materials in the eternal fight for health.

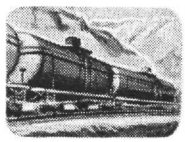
Through the use of synthetic organic chemicals, many anesthetics have been developed. The number of these anesthetics is of great value, since the physician can choose one suited to the patient's needs. This means less shock and greater comfort for the patient, thus often contributing to his swifter recovery.

Many other pharmaceuticals are made with the help of synthetic organic chemicals. Anti-malarial substances, synthetic adrenalin, man-made vitamins, anti-pyretics (to cut down fever), many kinds of sedatives, vehicles in which drugs are administered, and solvents used in extracting drugs from natural sources are some of the medicinal aids made possible by these chemicals.

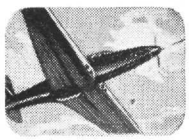
CARBIDE AND CARBON CHEMICALS CORPORATION, the Unit of UCC which pioneered in the field of synthetic organic chemistry, has made more than 160 synthetic organic chemicals available in commercial quantities. Many of these chemicals are important in various ways in the pharmaceutical industry.

Pharmaceutical manufacturers, and research and technical men in chemical and allied industries, are invited to send for a copy of the 100-page booklet P-2, "Synthetic Organic Chemicals," which technically describes the properties and some of the uses of these chemicals in pharmaceutical and other fields.

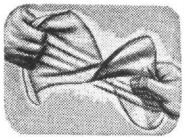
BUY UNITED STATES WAR BONDS AND STAMPS



SAVINGS FOR YOU! Synthetic chemicals in tank-car quantities serve as solvents and raw materials throughout industry to make more and better things at less cost to you.



COLD-PROOF! Coolant for liquid-cooled aircraft engines and base for anti-freeze in military cars and trucks is ethylene glycol, an important synthetic chemical.



MAGIC PLASTICS! Wonderful plastics that look like glass, stretch like rubber, and which are proof against water, sunlight, oils, and many chemicals are made from VINYLITE synthetic resins.

MAN-MADE! All types of synthetic rubber require synthetic organic chemicals for their manufacture. Here's hope for tires for you in the future.

UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC **New York 17, N. Y.**

Principal Units in the United States and their Products

ALLOYS AND METALS
Electro Metallurgical Company
Haynes Stellite Company
United States Vanadium Corporation

CHEMICALS
Carbide and Carbon Chemicals Corporation

ELECTRODES, CARBONS AND BATTERIES
National Carbon Company, Inc.

INDUSTRIAL GASES AND CARBIDE
The Linde Air Products Company
The Oxweld Railroad Service Company
The Prest-O-Lite Company, Inc.

PLASTICS
Bakelite Corporation
Plastics Division of Carbide and Carbon Chemicals Corporation

As one student to another

Because we know so well what changes have taken place on your campus and how they must be affecting your view of things, we would like to remind you of something.

Alcoa Aluminum probably means to you now just a whale of a lot of aluminum that is going into war tools.

But Alcoa, the company, is people.

And we have a long-time goal—a very human, peacetime goal we are saving in the hope of sharing with you. We would like you to think of us as Imagineers in aluminum, creators of employment and higher standards of living.

Alcoa is, first of all, a great collection of engineering knowledge based on experience that goes back to the birth of aluminum as a commercially available metal.

Then, it is imagination. It is the vision that sees aluminum, not as just another metal to sell but as a means of eliminating dead weight, or corrosion; as a means of reducing maintenance costs or increasing output.

The full significance of Alcoa can be summed up as experience in the application of aluminum to make more things available to more people. It's what we consider the only means of solving the perennial employment problem.

It requires constant inquiry. Constant study. Constant co-operation with every field of human effort that uses metal.

The results are as practical a way of bringing about a better world as any yet devised.

We hope, when we both return to the job of rebuilding the world, some of you will choose to do it with aluminum. That will mean, of course, with *Alcoa.*

ALCOA
REG. T. M.

A PARENTHETICAL ASIDE: FROM THE AUTOBIOGRAPHY OF

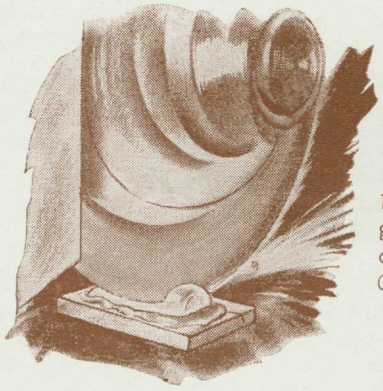
ALCOA ALUMINUM

• This message is printed by Aluminum Company of America to help people to understand *what we do* and *what sort of men* make aluminum grow in usefulness.

The synthetic sapphire that becomes a precious jewel...

1. High over Berlin on the instrument board of a bomber, these synthetic sapphires become the most precious jewels in the world. They're man-made jewels for instrument bearings. Without them, no bomber could drop its load with accuracy, no warship could navigate. Before Pearl Harbor most of these synthetic jewels came from abroad. But today industry is mass producing its own with the help of diamond blades and polishing compounds such as made by Carborundum.

2. Man-made sapphires are created by fusing aluminum oxide. To turn the rough boule into a bearing requires more than 100 precision operations, including cutting, grinding and polishing. No tolerance over 0.0003 in. is permissible. One of the best abrasives for producing a sapphire bearing is the diamond. So diamond grinding compounds by Carborundum are widely utilized.



3. War has given enormous impetus to the art of grinding. In industry, you may find operations which might be done better with abrasives. Carborundum engineers will be glad to consult with you on any such problem. The Carborundum Company, Niagara Falls, New York.

CARBORUNDUM
REG. U.S. BRAND PAT. OFF.
ABRASIVE PRODUCTS

Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company

Campus News

RESEARCH AND ENGINEERING KEEP GENERAL ELECTRIC YEARS AHEAD

TEST FLIGHT

TINY electric strain gages on the wing answer one of many plane-design problems. No bigger than a penny matchbox, these gages give on-the-spot readings that tell the engineers where to strengthen, where to lighten many of the plane members. Frequently, the readings on dials lead to a more efficient design technique and a desirable reduction in weight.

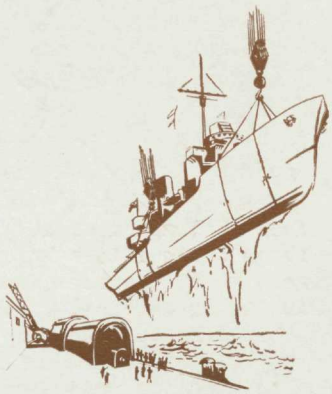
Armed with the General Electric strain gage, engineers can get the answer to ship, plane, and gun design problems quicker than ever before.

How deep can a submarine submerge? How big a firing charge will a gun stand? How great a load will a roll-bending machine take? The strain gage knows the answers.

BUBBLE-WELDING

"BUBBLE, bubble" takes the "toil and trouble" out of welding magnesium, the strong, lightweight metal derived—among other sources—from sea water. Magnesium is so light that a grand piano made from it could be lifted by one man . . . so strong that its use in airplane construction is desirable.

General Electric has developed a technique for welding this metal inside a "bubble," an invisible one of non-inflammable helium gas surrounding the welding arc. By means of the bubble, nitrogen and oxygen—which would otherwise combine with the magnesium—are excluded, and the welding conditions brought under accurate control.



200 FEET A MINUTE—UP!

A DESTROYER *could* move that fast, in that direction, if the world's most powerful motor were lifting it.

This giant direct-current motor is one of the youngest in the General Electric family of motors. It was recently completed at the company's Schenectady plant, and has just been shipped to Geneva, Utah. It possesses a maximum of 4,100,000 pound-feet torque, thus developing more turning power than any other motor, either a-c or d-c, ever built.

At Geneva, it will be installed in the DPC plant which is operated by the Geneva Steel Company, and will help roll out steel for Navy ships.

Hear the General Electric radio programs: "The G-E All-girl Orchestra" Sunday 10 p.m. EWT, NBC— "The World Today" news, every weekday 6:45 p.m. EWT, CBS.

GENERAL ELECTRIC

953-78-211

192,000 employees of the General Electric Company are on their jobs producing war goods and buying over a million dollars of War Bonds every week to hasten victory.